

Q1. (i) Find $\lim_{x \rightarrow 1} \frac{\sqrt{10-x^2}-3}{x-1}$

Q2. Suppose that

$$f(x) = \begin{cases} x^2, & x \leq -8 \\ 5, & -8 < x < 4 \\ \frac{2x-8}{|4-x|}, & x \geq 4 \end{cases}$$

Find

$$\lim_{x \rightarrow -8^-} f(x)$$

$$\lim_{x \rightarrow 4^+} f(x)$$

Q3. Find $\lim_{t \rightarrow \pi^-} \cot t \cos^2 t$